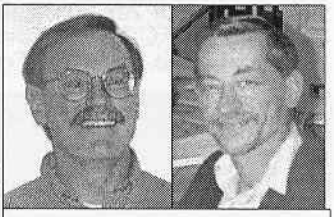
(*Astrophile*, Vol. 4, No. 7, March-April 1961). I have not been able to obtain a copy of an article in *The New York Times*, dated January 1, 1961 or the article "Unknown Covers from Discoverer XVII" in *Stamps* Jan. 4, 1961 Vol. 114, No 2. The only black and white photo of the cover I have refers to a NASA OPI sheet S-60-81, November 30, 1960. I have not been able to obtain the NASA OPI sheet S-60-81.

I have contacted most of the presidential libraries and museums related to the people involved but with no luck. I believe a personal touch is needed; someone to go to the library or museum and ask about the covers. My biggest fear is that the cover is lost within a government archive. Worst yet, the letter was kept and the cover was destroyed. Searching through archives also needs the personal touch - someone to take a few hours to go through a box of papers. There are archives of White and LeMay at the Library of Congress and Twining at the National Archives. Good luck! []

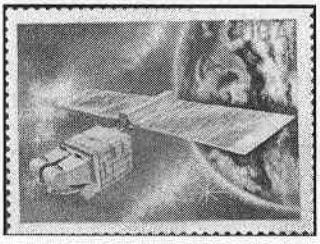
UN-MANNED SATELLITES ON POSTAGE STAMPS PART 9 - THE SPOT AND IRS SERIES

Don Hillger (SU-5200) and Garry Toth



D. Hillger G. Toth

This is the ninth in a series of articles about un-manned satellites on postage stamps. With this article we start a sub-series on environmental-observing satellites, featuring this time the low-earth polar-orbiting satellites in the SPOT and IRS series operated by France and India respectively. Article number two already covered the U.S. polar-orbiting Landsat environmental-observing spacecraft, along with similar-looking Nimbus weather satellites.



The SPOT (Satellite Pour l'Observation de la Terre) Earth resources satellite program began in 1978. SPOT was the first commercial satellite remote sensing system, and SPOT Image corporation was established in 1982 to market SPOT data and products. SPOT-1 was launched on 22 February 1986 and to date there have been five SPOT launches, with the last one on 4 May 2002. Successive generations of SPOTs have increased their spectral and spatial resolution capabilities for a number of applications: land-use, agriculture, forestry, mineral and oil resources, and cartography.

SPOTs are three-axis stabilized spacecraft in circular near-polar sun-synchronous orbits, similar to those used by weather satellites. However the narrower swath viewed by the instruments aboard SPOT means that not all portions of the Earth beneath are viewed each day. The cycle of orbits is repeated exactly every 26 days, but a given location is viewed on average every 2.4 days, with an interval ranging from a maximum of 4 days at the equator to

a minimum of 1 day near the poles.

The instrumentation on SPOT-1 provided 20 m resolution images in the visible and near-infrared spectrum as well as 10 m resolution panchromatic, wide-spectral-band black-and-white images. With SPOT-4, an important innovation was the addition of a spectral channel in the shortwave infrared, a region of the Earth's electromagnetic spectrum that is useful for determining characteristics of the ground, including the detection and monitoring of forest and range fires. SPOT-5 obtains multispectral images at 10 m resolution and panchromatic images at 2.5 m resolution.

SPOTs are basically of two designs: the earlier design used by SPOT-1, 2, and 3; and the later design used by SPOT-4 and 5. Although the bodies of all five spacecraft are similar, the solar panels are quite different. The first design used a two-part rectangular solar panel 15.6 m in length. The latter design used a 5-sectioned solar panel with the sections placed in a broad U-shape. Most of the postal items that show SPOT depict the first design, indicated as SPOT-1/2/3 in the table. One of the souvenir sheets, Guinea (1198a), specifically identifies the satellite as SPOT-2. For the latter design, only French Southern and Antarctic Territories (C130) shows the U-shaped solar panels. This solar panel design was also used by the French Helios, a scientific spacecraft that will be covered eventually in this series of articles.

The second environmental-observing satellite series discussed in this article is the IRS (Indian Remote Sensing) system. IRS is India's premier Earth resources satellite program. The first launch of an IRS satellite, IRS-1A, took place on 17 March 1988. To date eight IRS spacecraft have been launched, with only one failure, that of IRS-1E. The most recent IRS launched was IRS-P4, also called Oceansat-1, with sensors designed primarily for viewing marine and coastal environments. More IRS variations are planned over the next several years.

Like SPOT, IRS satellites are 3-axis stabilized spacecraft operating in circular near-polar sun-synchronous orbits. The 22 to 24-day repeat cycle, shorter than that of SPOT, is a function of the higher altitude of the orbit, closer to 900 km than SPOT's level of 800 km. The spatial resolution of imagery from IRS varies from about 70 m for the first satellites to 5.8 m for imagery from IRS-1C. The instrumentation generally consists of multi-spectral visible

and near-infrared sensors as well as panchromatic black-and-white imagers. In addition, Oceansat-1 contains both ocean-color instrumentation and multi-frequency microwave radiometers.

IRS spacecraft have box-shaped bodies, with two equal-and-opposite narrow solar panels. The IRS series has been featured on only two postal items known to the authors: IRS-1A on India 1352, and IRS-P4/Ocansat-1 on India 1847. This is a low number of philatelic items for a relatively long satellite series.

A table and images of several of the postal items showing these satellites are presented both here and in the Website developed by the authors: **http://www.cira.colostate.edu/ramm /Hillger /satellites.htm**. E-mail correspondence is welcome. Don Hillger can be reached at **hillger@cira.colostate.edu** and Garry Toth at **garry.toth@ec.gc.ca**. []

Checklist of Postal Items Showing SPOT and IRS

Country	Cat. No.*	Type**	Year	Notes
SPOT (France)				
Altai Republic	Local	Cuba 3023 ovpt. Russia 5984	199?	SPOT-1/2/3
Altai Republic	Local	Cuba 3023 ovpt. Russia 5726	199?	SPOT-1/2/3
Altai Republic	Local	Cuba 3023 ovpt. Russia 5728	199?	SPOT-1/2/3
Altai Republic	Local	Cuba 3023 ovpt. Russia 6067	199?	SPOT-1/2/3
Cen. Africa Rep.	535		1982	SPOT-1/2/3
Cen. Africa Rep.	BL203	S/S-1 (535)	1982	SPOT-1/2/3
Comoro Islands	386		1978	SPOT-1/2/3
Comoro Islands	BL184	S/S-1 (386)	1978	SPOT-1/2/3
Congo, Peoples Rep.	961A	In margin of S/S-1 (961)	1992	SPOT-1/2/3
Cuba	3023		1988	SPOT-1/2/3
Djibouti	702		1992	SPOT-1/2/3
Dominica	2240	In margin of S/S-1	2000	SPOT-1/2/3
French Polynesia	590	Imperforate S/S-1	1992	SPOT-1/2/3
French Southern & Antarctic Territory	C95		1986	SPOT-1/2/3
French Southern & Antarctic Territory	C130		1994	SPOT-4/5
Gabon	597		1986	SPOT-1/2/3

Guinea	1189a	In margin of S/S-1 (1189	1992	SPOT-2
Malagasy Rep.	1415h	Part of M/S-9 (1415a-i)	1999	SPOT-1/2/3
Malagasy Rep.	1415h S/S-1	S/S-1 (1415h)	1999	SPOT-1/2/3
Portugal-Madeira	152a	Part of S/S-4 (152 (2X (151,152a)))	1991	SPOT-1/2/3
IRS (India)				
India	1352		1991	IRS-1A
India	1847		2000	IRS-P4 Oceansat-1

*Scott number, unless indicated with Mi or BL for Michel
**S/S# = souvenir sheet, M/S# = miniature sheet, where # = number of stamps in sheet, and the numbers in parentheses are the catalog numbers of the stamps in the sheet.

FROM THE TREASURER

Terry Chamberlin (SU 1541)

Dues are Due

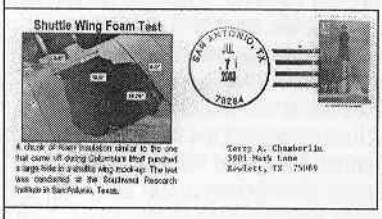
I would like to remind everyone that it is time to send in your 2004 dues. The *Astrophile* has grown in size the last few years, and with addition of a free cover in most issues, it is indeed a bargain. The Space Unit cannot accept credit card payments, but you can now pay your dues through PayPal. Please feel free to contact me if you are interested in PayPal.

Cover Contest

The Space Unit's cover contest will be held again this year, but with a different twist. I know many collectors are creating their own cachets, and with the ease of desktop printing, it is becoming increasingly popular. The year 2003 has provided many opportunities to design and create cachets, so I am asking for anyone interested in entering the contest to send me a photocopy of your cover.

The entry rules are: 1 - It must have a 2003 postmark, and, 2 - The entrant must create it. First prizewinner will have his Space Unit dues paid for one year, with the second and third winner receiving prizes yet to be determined. Good luck and I hope to hear from many of you.

Columbia Investigation



I created a cover for the July 7th shuttle wing foam test preformed at the Southwest Research Institute in San Antonio. I also have covers for the May 1st and June 6th tests. Does anyone know if covers exist for May 29th? I would like to hear from anyone who has been collecting covers for these tests. []